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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/051,046 | 01/22/2002 | Teruo Wakashiro | 020067 | 1714 |
| 23850 | 7590 | 04/23/2004 | EXAMINER | |
| ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP 1725 K STREET, NW SUITE 1000 WASHINGTON, DC 20006 | | | SWENSON, BRIAN L | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3618 | |

DATE MAILED: 04/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/051,046

Applicant(s)

WAKASHIRO ET AL.

Examiner

Brian Swenson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 4-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 4-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Acknowledgment is made of the amendment entered on 30 March 2004 where:
 - a. Claim 6 has been added; and
 - b. Claims 1-2 and 4-6 pending in this office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-2 and 4-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 2 recite the limitation "the all cylinders deactivated operation" in lines 10-11 of the claims. There is insufficient antecedent basis for the limitation "all" in the claim.
3. Clarification is requested for claim 6, page 5, line 6 "...determines that the cylinder deactivated operation is related"? What is related, does applicant mean the cylinder deactivated operation device is "activated"?

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,487,998 issued to Masberg et al.

Masberg et al. teach in Figures 1-6 and respective portions of the specification of a control apparatus for a hybrid vehicle comprising a driving power source composed of an engine (1) and a motor (4), where fuel supply to the engine is stopped (see at least Col. 2, lines 13-14), and the motor generates regenerative power during deceleration depending on the deceleration state (see at least Col. 7, lines 44+), wherein

the engine is a type of engine capable of executing cylinders deactivated operation for at least one cylinder (see at least Col. 20, lines 64+); and the control apparatus comprises:

a cylinder deactivated operation determination device for determining whether it is appropriate for the engine to enter a cylinders deactivated operation depending on the driving conditions of the vehicle (see at least Figure 5 and Col. 20, lines 64-68 and Col. 21, lines 1+);

a cylinder deactivated operation execution device (the reference teaches of using valve shutoff as a means for shutting off the cylinders, Col. 3, 32-34) for executing the cylinders deactivated operation of the engine when the cylinders deactivated operation is determined by the cylinder deactivated operation determination device.

Masberg et al. teach that the motor (4) is used as a generator to brake the vehicle (Col. 7, lines 49-51), but Masberg et al. is silent if the fuel supply to the engine is stopped when the vehicle is decelerated or braked. It would have been obvious to one having ordinary skill in the art at the time the invention was made to shut off the fuel supplied to the engine and deactivate the cylinders during deceleration based on Masberg et al.'s teaching that the objective of shutting off the cylinders is to over come

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the prior art's internal engine's inefficiencies at low rotary speeds (Col. 1, lines 13-33) that the engine would be subject to during braking, during cylinder shut off fuel is stopped (Col. 21, lines 1-7). Masberg et al. is also silent if the cylinder deactivated operation execution device closes both the intake valves and exhaust valves of the cylinders. It would have been obvious to one having ordinary skill in the art at the time the invention was made to shut both the intake and exhaust valves of the cylinders. One would be motivated to close both the intake and exhaust valves of the cylinders based on Masberg et al.'s disclosure that cylinders are switched off by valve shutoff (Col. 2, lines 10-15) and shutting off cylinders contributes to lessening of the release of harmful exhaust gases (Col. 1, lines 30-34). Shutting off both the intake and exhaust valves would provide the advantage of lessening the release of the exhaust gases.

In regards to claim 5: Masberg et al. teaches of an all cylinders deactivated operation (see at least Col. 2, lines 22-25).

5. Claims 2, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masberg et al. in view of U.S. Patent No. 6,360,728 issued to Sturman.

Masberg et al. disclose the claimed invention, in reference to claims 1 and 3 above except for disclosing a device that detects the operation of the cylinder deactivated operation execution device (valve shutoff means).

The use of a valve position sensor is well known in the vehicle art. Sturman teaches of a control module for an intake (20) and exhaust (22) valves in an internal combustion engine, taught to be variable valve timing Col. 7, line 52-53. Sturman teaches of an intake valve position sensor (90) and an exhaust valve position sensor

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(62) that sends signals to microprocessor (226), which sends signals to the main engine controller (222), see at least Col. 7, lines 1-5 and Figure 7. The microprocessor uses the signals and stored data to actuate a fuel injector (18) and the intake (20) and exhaust valves (22) for the internal combustion engine. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include intake and exhaust valve position sensors as taught by Sturman into the invention taught by Masberg et al. One would be motivated to include intake and exhaust valve position sensors to provide feedback to the control device (31) taught by Masberg et al., providing feedback of the position of the valves to the control device would provide the advantage of verifying that the valves are fully shut during cylinder shut off.

In regards to claim 4, Masberg et al. teach that the throttle valve position is an operating parameter (Col. 8, lines 41-42), but is silent if the fuel supply is gradually increased by a predetermined amount depending on the throttle opening at the time fuel is restarted. It would have been obvious to one having ordinary skill in the art at the time the invention was made to gradually increase the amount of fuel to the cylinders when the shut off cylinders are restarted. One would be motivated to gradually increase the fuel supply to smoothly bring the shut off cylinders back to operating speed to reduce shocks in the vehicle during start up of the cylinders.

In regards to claim 6, it would have been obvious to one having ordinary skill in the art at the time of invention to first stop fuel to the engine prior to closing the intake and exhaust valves in the invention taught by Masberg et al. and as modified Sturman.

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One would be motivated to stop fuel prior closing the valves to allow all the fuel to be combusted and to prevent a backfire in the engine.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 6,718,944 issued to Franke et al. teaches of a cylinder shut off control feature.

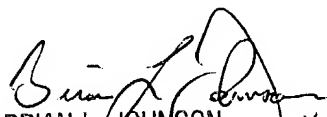
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Swenson whose telephone number is (703) 305-8163. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Johnson can be reached on (703) 308-0885. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian Swenson
Examiner
Art Unit 3618

BIS 4/19/04
bls


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